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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/772,699	02/05/2004	Leroy M. Edwards	8540G-000156	5123

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EXAMINER	
WALKER, KEITH D	
ART UNIT	PAPER NUMBER
1745	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/09/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/772,699	EDWARDS ET AL.	
	Examiner	Art Unit	
	Keith Walker	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 February 2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement filed on 2/5/04 has been placed in the application file and the information referred to therein has been considered as to the merits.

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "110" and "112" have both been used to designate the enclosure and hydrogen flow lines.

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "enclosure is a coolant flow path" must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement-drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate

changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The disclosure is objected to because of the following informalities: Paragraph [0026] of the Specification alludes to a Figure 3. No Figure 3 is present in the application.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-20 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a liquid coolant, does not reasonably provide enablement for any coolant, such as ambient air or oxygen. The specification does not

enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims. The specification only alludes to using a liquid coolant and does not suggest using a gas as a cooling means. For instance, the vent claimed needs to be able to separate a liquid coolant from a hydrogen gas but not separate two gases from each other, a cooling gas from the hydrogen gas.

Claims depending from claims rejected under 35 USC 112 are also rejected for the same.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

4. Claims 2 & 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The list is an improper Markush group. The statement should read "selected from the group consisting of...and" not "one of...and". If a Markush group was not intended, then the list should be in alternative form using "or" instead of "and".

5. Claims 4 & 5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear how the enclosure that can encompass the hydrogen flow path, which would include the fuel cell itself, could be a reservoir that houses a liquid.

Claims depending from claims rejected under 35 USC 112 are also rejected for the same.

Claim Interpretation

Concerning the language "adapted to" or "capable of", it is held that the recitation that an element is "adapted to" or "capable of" performing a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense (MPEP 2111.04).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1, 2, 4-9, 11-16, 19 & 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6,277,509 (Wheeler) in view of US 2004/0062964 (Matsuoka) and US Publication 2003/0064266 (Ogami).

Wheeler teaches a fuel cell system with a hydrogen flow path, a coolant flow path and an enclosure around part of the hydrogen flow path and an enclosure around the coolant reservoir (Fig. 1; 6:20-60, 7:10-25,13:40-45).

Wheeler is silent to the coolant reservoir having a hydrogen vent.

Matsuoka teaches a fuel cell system with a coolant reservoir having a hydrogen vent in the wall of the enclosure. The vent separates the fuel cell exhaust gases from

the liquid water, allowing the unnecessary gasses to pass through to the atmosphere but keeping the liquid coolant inside the reservoir. An enclosure surrounds the entire fuel cell system (Figs. 1-5A; [0030,0031,0034,0037,0040]). This second enclosure houses the entire system, allowing for easy application integration. While the concentration of the hydrogen within the enclosure is not expressly taught, reducing the amount of unnecessary gasses like hydrogen is taught and it would be obvious to one skilled in the art to rid the enclosure of as much hydrogen gas as possible with a best case being zero percent. The motivation to reduce the hydrogen gas in the container is for both safety and increased performance. A build up hydrogen is a concern for a possible explosion and the more air that enters the cooling water, the water distribution becomes non-uniform and therefore the performance of the fuel cell deteriorates (Ogami [0023-0026]).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the fuel cell system of Wheeler with the hydrogen vent of Matsuoka to increase the safety of the system by disposing of a build up of hydrogen, leading to a possible explosion and to increase the performance of the fuel cell by improving the cooling effect of the coolant by disposing of the gasses in the coolant, allowing a more uniform distribution of the liquid coolant.

7. Claims 10 & 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6,277,509 (Wheeler) in view of US 2004/0062964 (Matsuoka) and US

Publication 2003/0064266 (Ogami) as applied to claims 1 & 16 respectively and further in view of US Patent 4,168,349 (Buzzelli).

The teachings of Wheeler, Matsuoka and Ogami as discussed above are incorporated herein.

Wheeler, Matsuoka and Ogami are silent to the vent acting like a flame barrier.

Buzzelli teaches a hydrogen vent that acts as a flame and explosion barrier (2:55-65). Using a hydrogen vent that also blocks flames increases the safety of the fuel cell system.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the vent of Matsuoka with the flame barrier vent of Buzzelli to improve the safety of the fuel cell device.

8. Claims 3 & 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6,277,509 (Wheeler) in view of US 2004/0062964 (Matsuoka) and US Publication 2003/0064266 (Ogami) and US Patent 4,168,349 (Buzzelli) as applied to claims 2 & 17 respectively and further in view of US Publication 2004/0151962 (Adams).

The teachings of Wheeler, Matsuoka, Ogami and Buzzelli as discussed above are incorporated herein.

Wheeler, Matsuoka, Ogami and Buzzelli are silent to the vent being made of plastic.

Adams teaches a gas permeable and liquid impermeable vent made from plastic (Fig. 6, [0056]). Adams discloses different materials available to construct vents.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to use the teachings of Adams to learn of the materials available for gas permeable and liquid impermeable vents.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Keith Walker whose telephone number is 571-272-3458. The examiner can normally be reached on Mon. - Fri. 8am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

K. Walker

PATRICK JOSEPH RYAN
SUPERVISORY PATENT EXAMINER